L 16589-65
ACCESSION NR: AT4048061

ENCLOSURE: 01

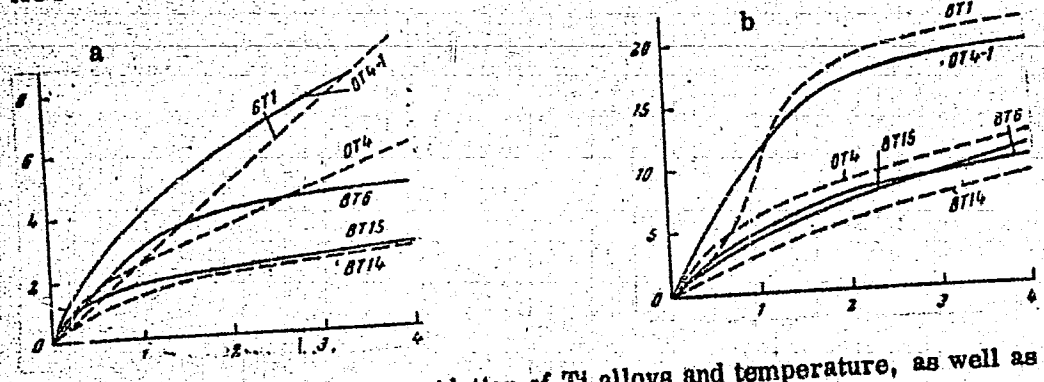


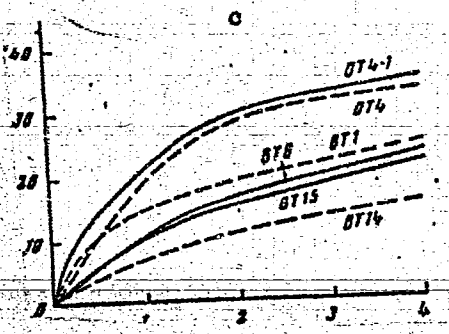
Fig. 1. Relationship between oxidation of Ti alloys and temperature, as well as duration of heating: a - at 900C, b - at 1000C; c - at 1100C; d - at 1200C.

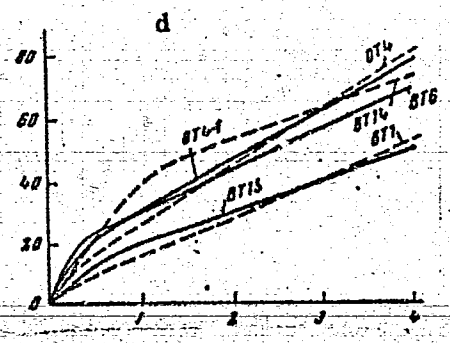
In each graph, ordinate = wt. gain in mg/cm^2; abscissa = duration of heating in hrs.

Card 4/6

L 16589-65
ACCESSION NR: AT4048061

ENCLOSURE: 02





Card 5/6

L 16589-65
ACCESSION NR: AT4048061

ENCLOSURE: 03

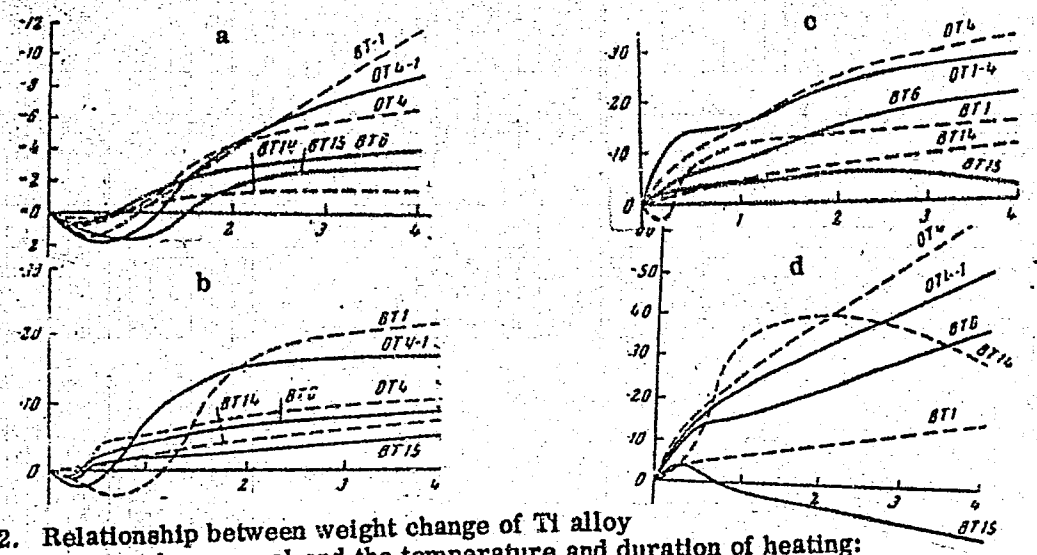


Fig. 2. Relationship between weight change of Ti alloy samples after scale removal and the temperature and duration of heating: a - at 900C; b-at 1000C; c-at 1100C; d-at 1200C. In each graph, ordinate = wt. change in ng/cm^2; abscissa = duration of heating in hrs.

Card 6/6

L 15665-65 EWI(m)/EWP(w)/EWA(d)/EWP(t)/EWP(k)/EWP(b) Pf-4 ASD-3/AFFTC/
ESB-3/IJP(c)/ASD(f)-2/ASD(m)-3 MJW/JD/HW/MLK S/0000/64/000/000/0249/0254
ACCESSION NR: AT4048081

AUTHOR: Pavlov, I.M., Tarasevich, Yu. F., Shelest, A. Ye.

TITLE: Effect of the conditions of plastic deformation and further working on the properties of several titanium alloys

SOURCE: Soveshchaniye po metallurgii, metallovedeniyu i primeneniyu titana i yego splavov. 5th, Moscow, 1963. Metallovedeniye titana (Metallography of titanium); trudy* soveshchaniya, Moscow, Izd-vo Nauka, 1964, 249-254

TOPIC TAGS: titanium alloy, titanium alloy working, plastic deformation, cooling rate, titanium alloy strength, titanium alloy hardness, titanium alloy rolling/alloy OT4, alloy VT6, alloy VT14

ABSTRACT: The authors investigated the effect of plastic deformation and subsequent cooling at different rates on the mechanical properties of several $\alpha+\beta$ b titanium alloys (martensite, types OT4, VT6 and VT14), where the β phase may be partially set at room temperature. The alloys were rolled at a rate of 0.5 m/sec followed by cooling either in water, asbestos or air. The cooling rate as measured by thermocouples was 60-70 deg/sec in water, 4.3-5 deg/sec in asbestos and 6-6.5 deg/sec in air for the VT14 alloy. Mechanical properties were then determined. The tests showed differences in

Card 1/3

L 15665-65
ACCESSION NR: AT4048081

hardness of VT14 alloy samples cooled under different conditions. All alloys showed slight variations in hardness when cooled from 500-800C with 20% compression under the roller. Hardness was increased significantly by 40% compression and lowering of the temperature from 800C. The effect of cooling rate on strength was noticeable only at rolling temperatures above 900C. For 20% compression the ultimate strength changed smoothly as the rolling temperature varied. This was not observed for higher compression values, confirming the effect of plastic deformation on the mechanical properties of the alloy. Relative narrowing was increased with compression at all rolling temperatures and cooling rates, while the temperature relationship was constant with a minimum at 1000C and maximum at 700C. Elongation was lowered during rolling at temperatures below 800C with maximum elongation at moderate cooling rates beginning with 1100C. The data obtained make it possible to plan methods for improving the mechanical properties of titanium alloys by thermomechanical working. However, the thermal stability of the alloys after working will be low and the alloys will be used successfully only at normal temperatures. Additional research is required to find ways of employing titanium alloys at higher temperatures. "Ye. G. Konstantinov took part in the investigations." Orig. art. has: 4 figures.

Card 2/3

L 15665-65

ACCESSION NR: AT4048081

ASSOCIATION: none

SUBMITTED: 15Jul64 ENCL: 00 SUB CODE: MM

NO REF SOV: 003 OTHER: 000

Card 3/3

L 9961-65 EWT(m)/T/EWP(b) ASD(m)-3 JD/MLK

ACCESSION NR: AT4046865 S/0000/64/000/000/0336/0341

AUTHOR: Pavlov, I.M. (Corresponding member AN SSSR); Rastegayev, M.V.; Danil'chenko, A.N.; Zharov, V.M.; Falaleyeva, Z.S.; Mezis, V.Ya.; Dzugutov, M.Ya.; Vinogradov, Yu.

TITLE: Effect of primary thermoplastic treatment on the properties of a heat resistant alloy

SOURCE: AN SSSR. Nauchnyy sovet po probleme zharoprochnykh splavov. Issledovaniya staley i splavov (Studies on steels and alloys). Moscow, Izd-vo Nauka, 1964, 336-341

TOPIC TAGS: thermoplastic treatment, heat resistant steel, steel upsetting, steel microsection, heat resistant alloy, strain hardening, impact toughness, stress rupture strength

ABSTRACT: Lately, many articles have been published on plastic deformation under pressure combined with thermal treatment to obtain metals of high strength. In almost all publications, the tested metal had previously undergone treatment under pressure. In the opinion of the authors of the present paper, special attention should be paid to the initial thermoplastic treatment. If the required properties are reached at this time, further treatment is unnecessary. Previously, the authors of this article investigated cast heat-resistant alloy B from an arc

Card 1/5

L 9961-65

ACCESSION NR: AT4046865

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furnace by upsetting, thus obtaining various structural densities and grain boundaries affecting the heat resistance of the steel. In the given paper, heat-resistant alloy B was obtained by electric slag smelting. Thus, the initial cast structure was much better than the one described in the previous paper. The B alloy is complex and has a narrow interval for thermal treatment under pressure. The ingot (diam. 150 mm, length 600 mm) was cut into three equal parts of 150x200 mm. The parts were upset as shown in Figs. 1-3 of the Enclosure. The first two parts underwent the same degree of deformation, namely 0.844. The final contact coefficient (ratio of cylinder diameter to height) at the end of compression was 17.1. For the third part, the degree of deformation was 0.85 and the final contact coefficient was 12.9. Microsections showed that all three parts had a similar dense structure. Further, all three parts were cut into 20x20x70 mm samples for measurement of the yield point and strength. The third part had the highest values, while part two had the lowest. The second part had the highest impact toughness, while part 3 had the lowest. The stress-rupture strength after 100 hours was 14 kg/mm^2 for part 1, 16 kg/mm^2 for part 2 and 20 kg/mm^2 for part 3, which was verified by microstructural analysis; before 30 hours, the stress-rupture strength of part 1 was higher than that of part 2. It is noted in conclusion that thermoplastic treatment leads to high quality metals and alloys. The use of electric slag smelting improves the metal structure. Improvement of mechanical

Card 2/5

L 9961-65
ACCESSION NR: AT4046865 0

properties depends to a high degree on the correct choice of deformation procedure, which still requires further investigation. Orig. art. has: 5 figures, 1 table and 5 formulas.

ASSOCIATION: none

SUBMITTED: 16Jun64 ENCL: 02 SUB CODE: MM

NO REF SOV: 004 OTHER: 000

Card 3/5

L 9961-65
ACCESSION NR: AT4046865

ENCLOSURE: 01

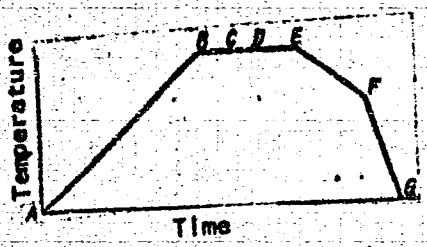


Fig. 1. Diagram of upsetting of part 1 of alloy B: AB-heating in furnace; BC-heating at given temperature; CD-upsetting in press; DE-heating in furnace; EF-slow cooling in glass wool; FG-air cooling.

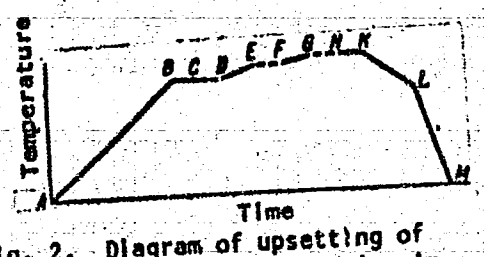


Fig. 2. Diagram of upsetting of part 2 of alloy B: AB-heating in furnace; BC-heating at given temperature; CD-upsetting; DE-heating in furnace; EF-second upsetting; FG-heating in furnace to temperature of G; GH-third upsetting; HK-heating in furnace to temperature of H; KL-slow cooling in glass wool; LM-air cooling.

Card 4/5

L 9961-65

ACCESSION NR: AT4046865

ENCLOSURE: 02

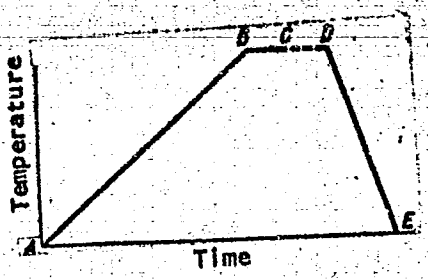


Fig. 3. Diagram of upsetting of part 3 of alloy B: AB-heating in furnace; BC-heating at given temperature; CD-upsetting during one stroke of press; DE-air cooling.

Card 5/5

L 8491-65 EWT(m)/EPR/EWP(k)/EWP(q)/EWP(b) Pf-4/Pe-4 ASD(f) JD/EW/MLK

ACCESSION NR: AT4046866 S/0000/64/000/000/0342/0344

AUTHOR: Pavlov, I. M. (Corresponding member AN SSSR); Zharov, V. M. B

TITLE: A specific case of the investigation of strain hardening of metals 18

SOURCE: AN SSSR. Nauchny*y sovet po probleme zharoprochny*kh splavov. Issledovaniya staley i splavov (Studies on steels and alloys). Moscow, Izd-vo Nauka, 1964, 342-344

TOPIC TAGS: metal hardening, metal strain hardening, metal cold working, plastic deformation, aluminum, cast aluminum

ABSTRACT: Metals may be hardened in different ways, including heat treatment, neutron bombardment, cold working, etc., but hardening by cold plastic deformation has not been investigated sufficiently. Usually, cold working is employed with metals which have previously been subjected to thermal pressure treatment. However, the present development of continuous metal casting suggests that cast ingots will soon be used for cold stamping. The present paper therefore compares strain hardening of cast metal with metal hardening by pressure with recrystallization during annealing. The cast aluminum tested had only 0.02% of inclusions and a limit strength of 3.5 kg/mm^2. Two other cast billets cut from the ingot were drawn out on the MP-75 pneumatic hammer and cooled in water after each impact. The degree

Card 1/3

L 8491-65

ACCESSION NR: AT4046866

of deformation is usually estimated by the "forging coefficient" which shows the ratio between the billet cross section before and after drawing, or the ratio of initial and final lengths. Fig. 1 of the Enclosure shows the increase in limit strength of aluminum after cold plastic deformation. The second part of the investigation considered the strength after cold working of the same aluminum previously heat treated under pressure and annealed. The limit strength of the annealed aluminum was 4.9 kg/mm^2. Fig. 1 shows that at y=2.72 maximal hardening is reached. Comparison of cold working of cast and hot-forged metal shows that the cast metal, after cold working, reaches the strength of forged metal which had a higher initial strength. It is found that cast aluminum billets may also be used for cold working. The strain hardening of cast aluminum is more rapidly effective than the cold working of aluminum previously hardened under pressure and recrystallized. Cold working of cast metal gives the same results as hot-treated metal when the actual deformation equals 2.72. Orig. art. has: 2 figures.

ASSOCIATION: none

SUBMITTED: 16Jun64 ENCL: 01 SUB CODE: MM

NO REF SOV: 000 OTHER: 001

Card 2/3

L 8491-65

ACCESSION NR: AT4046866

ENCLOSURE:01

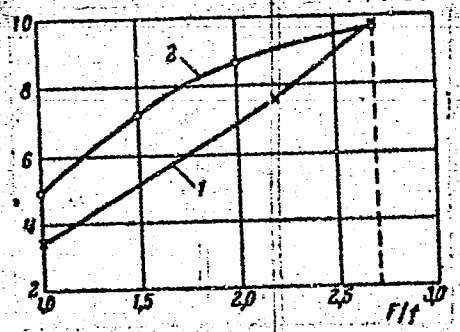


Fig. 1. Increase in limit strength of aluminum after cold plastic deformation: 1 - aluminum with initial cast structure; 2 - cold working of aluminum after forging and annealing at 400C.

Card 3/3

PAVLOV, I.M.; OSADCHIY, V.Ya.; GETIYA, I.G.; FROLOCHKIN, V.V.; KOLIKOV, A.P.

Investigating the process of rapid cross rolling. Izv. vys. ucheb. zav.; chern. met. 7 no.3:107-112 '64. (MIRA 17:4)

1. Moskovskiy institut stali i splavov.

L 8752-65 EWT(m)/EPF(c)/T/EWP(k)/EWP(b) Pf-4/Pr-4 IJP(c)/ASD(m)-3 MJW/JD/HW/DJ

ACCESSION NR: AP4045812 S/0148/64/000/009/0088/0094

AUTHOR: Pavlov, I. M.; Burkhanov, S. F.; Shor, E. R.; Osipov, E. Ye.; Chinenov, A. M.

TITLE: Effect of lubricants on cold rolling of thin strips and foil from VT-14, VT-15, and VT-16 titanium alloys

SOURCE: IVUZ. Chernaya metallurgiya, no. 9, 1964, 88-94

TOPIC TAGS: titanium alloy, VT-14 alloy, VT 15 alloy, VT 16 alloy, alloy cold rolling, strip rolling, foil rolling, lubrication effect

ABSTRACT: Titanium-base VT-14, VT-15, and VT-16 alloys with a tensile strength and elongation (in the aged condition) ranging from 115 to 160 kg/mm^2 and from 3 to 10%, respectively, were rolled to an initial thickness of 1.5 mm, vacuum annealed, and then cold rolled in five passes using various lubricants. The thinnest strip, 0.66—0.69 mm thick, was obtained with the LZ-203 lubricant, a synthetic compound of the type of complex esters containing amines. Castor oil and an LZ-171 lubricant were next in effectiveness. The rest of the

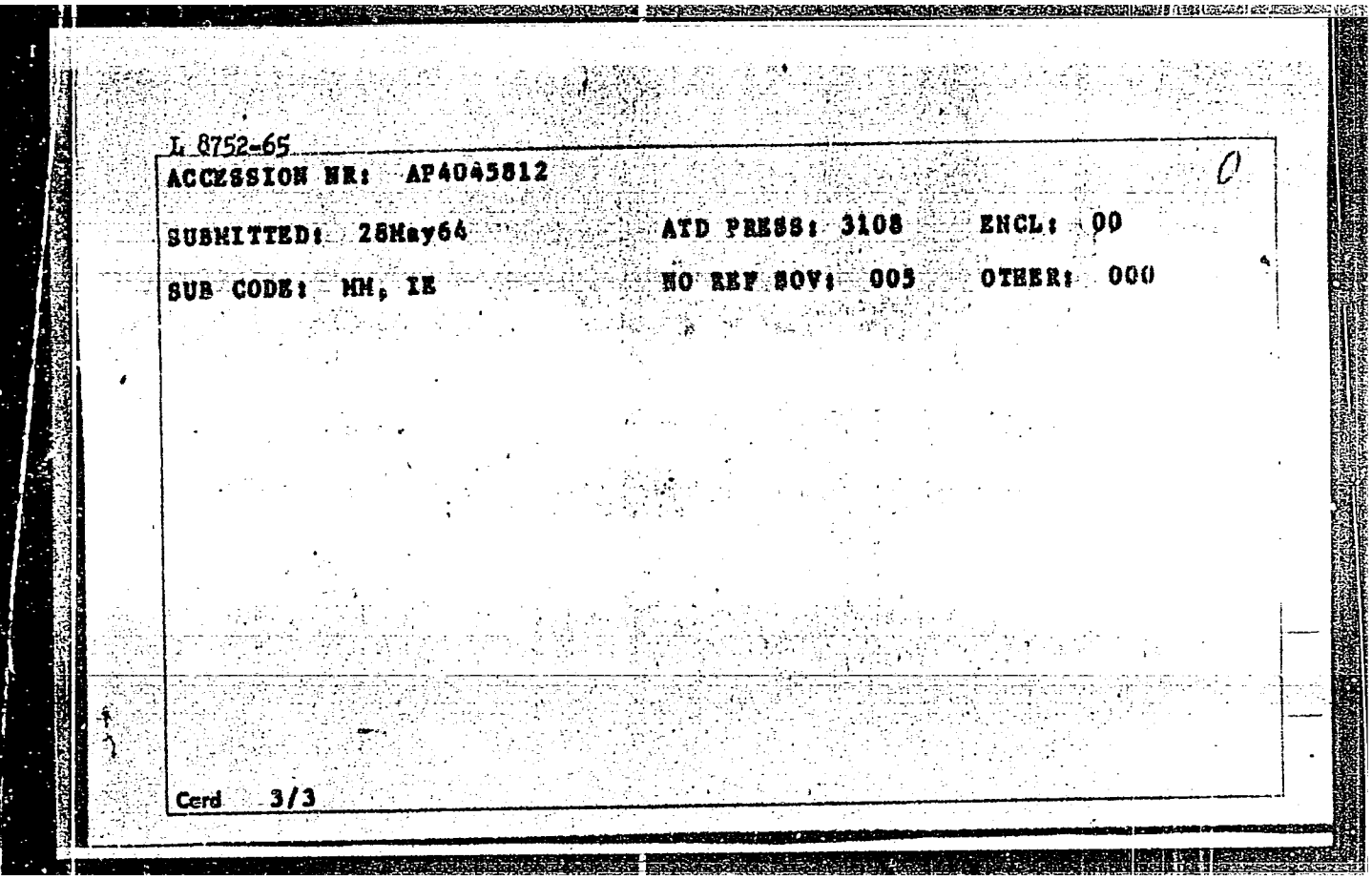
Card 1/3

L 8752-65
ACCESSION NR: AP4045812

lubricants tested produced no effect. Compared with rolling without a lubricant, the most effective lubricant reduces roll pressure by 20—30%, depending on the alloy rolled. In rolling alloy foils, the strip was first rolled to a thickness of 0.5 mm, vacuum annealed, and then rolled to the minimum thickness possible. Castor oil and a synthetic LZ-142[a] lubricant (a triethyleneglycol ester of complex fatty acids with a 10% addition of oleic acid) were the best and were equally effective for foils 1.5—0.5 mm thick, especially in rolling VT-14 alloy. In rolling foil thinner than 0.5 mm, castor oil produced the best results. Foil 0.13 mm thick with a good surface and uncracked edges was obtained. The authors believe that with process annealing and better rolling equipment, foil thinner than 0.1 mm can be readily obtained. Orig. art. has: 5 figures and 1 table.

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow Institute for Steel and Alloys)

Card 2/3



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ACCESSION NR: AP4045812 0

SUBMITTED: 28May64 ATD PRESS: 3108 ENCL: 00

SUB CODE: MM, IE NO REF SOV: 005 OTHER: 000

Cerd 3/3

PAVLOV, I.M.; DREGAN, I. [Dragan, I.]

Stu ies on the influence of reduction conditions in cold rolling on the magnetic and electric properties and the degree of perfection in the texture of transformer steel. Rev Roum metallurg 9 no. 1:75-85 '64.

L 34518-65 EWP(k)/EWA(c)/EWT(m)/EWP(b)/T/EWA(d)/EWP(t) Pf-4 IJP(c) 32
MJW/JD/HW/GS S/0000/64/000/000/0255/0262 30
ACCESSION NR: AT4048082 B+1

AUTHOR: Pavlov, I.M., Konstantinov, Ye. G., Taresevich, Yu. F., Shelest, A. Ye.

TITLE: Investigation of the principal parameters of hot and warm rolling of several titanium alloys under peculiar conditions of stress

SOURCE: Soveshchaniye po metallurgii, metallovedeniyu i primeneniyu titana i yego splavov, 5th, Moscow, 1963. Metallovedeniye titana (Metallography of titanium); trudy* soveshchaniya. Moscow, Izd-vo Nauka, 1964, 255–262

TOPIC TAGS: titanium alloy, titanium alloy rolling, titanium alloy stress, titanium alloy plasticity/alloy OT4, alloy VT6, alloy VT14, alloy VT15, alloy VT1

ABSTRACT: The aim of this investigation was to study the plasticity, stress and deformation of titanium alloys on a "200" rolling mill (roll diameter 213 mm, rolling rate 0.5 m/sec, steel rolls) equipped with dynamometers for measuring the pressure on the rolls and torque meters for measuring the torque of the rolls. Type OT4, VT1, VT6, VT14 and VT15 alloys were selected; after being heated uniformly for 15-35 minutes, depending on the temperature of the rolls, the samples were rolled with an average compression of 20, 40 and 60% (with similar initial depth and variable final depth) at 500–1100C (every 100C). The tests showed that at rolling temperatures above 900C the specific

Card 1/3

pressure was relatively low. Only the VT15 alloy at a rolling temperature of 1100C and compression of 20% had a specific pressure of about 9 kg/mm^2. The specific pressure increased more rapidly for the tested alloys than with technical titanium when the temperature dropped from 1100 to 900C. As the compression increased, the specific pressure increased due to friction. Lowering of specific pressure as the degree of deformation rises may be explained by crack formation in the metal due to unequal deformation because of the stressed condition in the narrow strips. This leads to higher lateral deformation in comparison with longitudinal deformation. The OT4, VT6, VT14 and VT15 alloys showed a lower plasticity than the VT1 alloy, the VT15 alloy having the lowest. The strips were widened by motion of the lateral surfaces into the contact surface, although widening was also caused by slipping along the contact surface, which was insignificant. Maximum widening at 20, 40 and 60% compression was obtained with VT1 and VT15 alloys and at 900C with VT6 and VT14 alloys at 800C. As the degree of deformation increased, the widening rose for all alloys. Rolling of samples of various widths (8-60 mm) with 20% and 40% compression at 900C resulted in increased specific

L 34518-65

ACCESSION NR: AT4048082

pressure together with the width, specific pressure increasing together with compression and in inverse proportion to width increase. The curves in the paper show that the absolute widening of the sample for all compression values first increases (for narrow widths), reaches a maximum value, and then drops as the width increases. Orig. art. has: 4 figures and 6 tables.

ASSOCIATION: Laboratoriya plasticheskoy deformatsii Instituta metallurgii im. A. A. Baykova (Laboratory of Plastic Deformation, Institute of Metallurgy)

SUBMITTED: 15Jul64 ENCL: 00 SUB CODE: MM

NO REF SOV: 006 OTHER: 000

Card 3/3

ACC NR: AT7004415 (N) SOURCE CODE: UR/0000/66/000/000/0051/0055

AUTHOR: Pavlov, I. M.; Tarasevich, Yu. F.; Shelest, A. Ye.

ORG: none

TITLE: Deformations in the neck area of tensile-test specimens of certain titanium alloys

SOURCE: AN SSSR. Institut metallurgii. Napryazhennoye sostoyaniye i plastichnost' pri deformirovanii metallov (Stress condition and plasticity during metal deformation), Moscow, Izd-vo Nauka, 1966, 51-55

TOPIC TAGS: titanium alloy, tensile testing machine, tensile test, crystal orientation/ OT4 titanium alloy, VT6 titanium alloy, VT14 titanium alloy, IM-12A tensile testing machine

ABSTRACT: The deformations at the site of the greatest reduction in area of Ti (VT1) and Ti-alloy (OT4, VT6, VT14) test specimens in two mutually perpendicular directions were compared in order to indirectly obtain information on the anisotropy of mechanical properties. An IM-12A tensile testing machine was employed and the specimens were previously subjected to various types of thermomechanical treatment (rolling at 500 to 1100°C through every 100°C with reduction of area amounting to 20, 40 and 60% and with subsequent cooling in water, air and under asbestos). The criterion used to estimate deformation in the neck in two mutually perpendicular directions was the

ACC NR: AT7004415

difference between the maximum d_1 and minimum d_2 dimensions of the specimen's neck, $\Delta d = d_1 - d_2$. Findings: for technically pure titanium (VT1) Δd is virtually unaffected by the rate of cooling following rolling, and it increases with increase in reduction of area, particularly when the rolling temperatures are below 900°C. For the VT6 alloy Δd increases with decreasing temperature. For the VT14 alloy the maximum values of Δd are observed in most cases following treatment at 700-800°C. An analysis of the findings shows that the pattern of variation in Δd cannot be unambiguously related to the variation in mechanical properties of these alloys. On the other hand, it is interesting to note that, for all the alloys investigated, the position of the axes of d_1 and d_2 is uniquely determined by rolling temperatures: at 900-1100°C the maximum axis lies in the rolling plane, whereas at 500-800°C it extends in the perpendicular plane. This may be associated with the temperature dependence of crystallographic orientation: at 900-1100°C the alloys chiefly consisted of the β-phase with bcc lattice whereas the temperatures of 500-800°C pertained to the region of the existence of the α-phase with hexagonal lattice. Orig. art. has: 4 figures.

SUB CODE: 13, 11/ SUBM DATE: 27Sep66/ ORIG REF: 003

Card 2/2

ACC NR: AT7004417 (N) SOURCE CODE: UR/000/66/000/000/0086/0088

AUTHOR: Pavlov, I. M.; Mekhed, G. N.; Ch'ien Tseng-Shih

ORG: Laboratory of Plastic Deformation of Metals, Institute of Metallurgy im. A. A. Baykov (Laboratoriya plasticheskoy deformatsii metallov Instituta metallurgii)

TITLE: Device for static tensile tests of metals and alloys at subzero temperatures

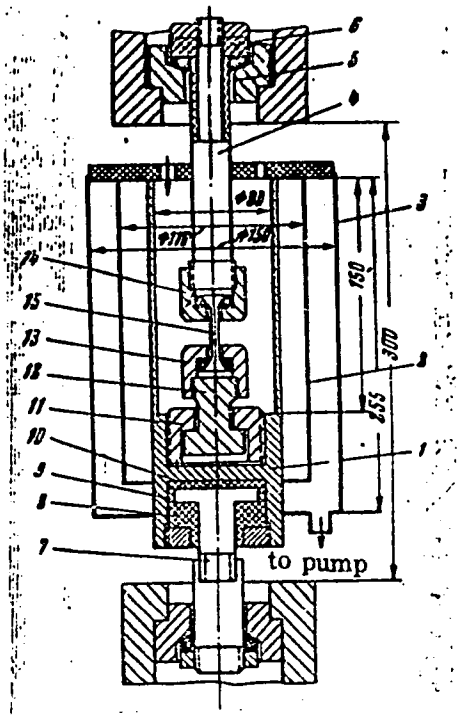
SOURCE: AN SSSR. Institut metallurgii. Napryazhennoye sostoyaniye i plastichnost' pri deformirovanii metallov (Stress condition and plasticity during metal deformation), Moscow, Izd-vo Nauka, 1966, 86-88

TOPIC TAGS: tensile test, static test, cryostat, metal test, low temperature research

ABSTRACT: Virtually every device for the tensile testing of specimens at low temperatures (reaching -196°C or even lower) is insufficiently airtight and involves leakage of coolant. This is because the specimen is linked to the lower clamp of the tensile testing machine by a long hose which passes through an opening in the bottom of the coolant container. In this connection, the authors developed in the Institute of Metallurgy im. A. A. Baykov a new improved device for tensile testing of specimens at temperatures as low as -268.8°C. The device (see figure) consists of a steel Dewar vessel containing the coolant mixture and hoses 4 and 7 attached to the clamps of the tensile testing machine. The Dewar vessel consists of three containers 1, 2, 3 of different diameters, inserted one in another. Innermost container 1 is filled with

Card 1/3

ACC NR: AT7004417



Cryostat for tensile tests at subzero temperatures

Card 2/3

ACC NR: AT7004417

with liquid helium, liquid nitrogen or a mixture of liquid nitrogen and gasoline, depending on the subzero temperature desired. During tests with liquid helium the space between the walls of containers 1 and 2 is filled with liquid nitrogen, while air is evacuated from the space between the walls of containers 2 and 3. With the aid of textolite attachments 6, 8, 9, 10 and wood tube 10 the coolant bath is insulated from contact with any metal parts linked to the tensile testing machine. Specimen 15 is attached to hose 4 and work part 12 by means of nuts 13 and 14. Removal of the ruptured specimen and insertion of a new specimen are accomplished by turning work part 12 through 90° so as to release it from nut 11 which is constantly linked to the bottom of the inner container. This device reduces to nil the leakage of coolant and assures an accurate and stable maintenance of the desired temperatures. Its design is simple and compact and it can be successfully operated as an attachment to an IM-12 type standard tensile testing machine. Orig. art.has: 1 figure.

SUB CODE: 13, 11/ SUBM DATE: 27Sep66/ ORIG REF: 016/ OTH REF: 009

Card 3/3

ACC NR: AT7004419 (A) SOURCE CODE: UR/0000/66/000/000/0103/0106

AUTHOR: Pavlov, I. M.; Osipov, V. G.; Ushakov, Ye. V.

ORG: none

TITLE: Compressive tests at elevated temperatures

SOURCE: AN SSSR. Institut metallurgii. Napryazhennoye sostoyaniye i plastichnost' pri deformirovanii metallov (Stress condition and plasticity during metal deformation). Moscow, Izd-vo Nauka, 1966, 103-106

TOPIC TAGS: metal test, metallurgic research, compressive stress, temperature test

ABSTRACT: A new method of compressive tests of this kind is described. The tapered heads of specimen 1 (see figure) are inserted in the sockets of two dies having the same cone angle. To improve contact and eliminate the possibility of burnout, copper-foil linings 3 are inserted between the dies and platens 4. The current for heating the specimens is supplied to the platens via busbars 6. Coils 7 for the passage of water serve to prevent overheating of the dies. This device can be used to perform compressive tests of specimens at temperatures of up to 1000°C and it is superior to its previous counterparts in that it assures a greater uniformity of deformation of the specimen owing to a more uniform temperature field and stress-strain diagram in the middle cylindrical segment of the specimen. This is due to the presence of colder

Card 1/2

ACC NR: AT7004419

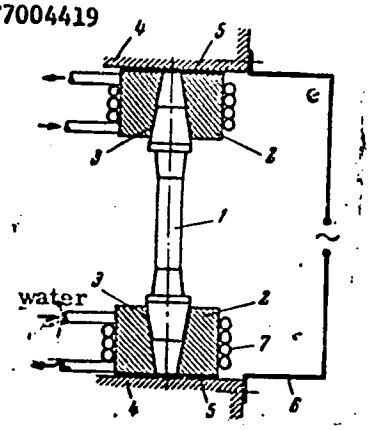


Fig. 1. Schematic of compressive test:

1 - specimen; 2 - die; 3 - lining; 4 - platen; 5 - lining; 6 - busbar; 7 - coolant coil

metal at both ends of the specimen and to the automatic decrease in current density in areas with higher temperature and increase in this density in areas with lower temperature; a rise in temperature in some cross sectional area of the specimen causes a decrease in deformation resistance in that area. (During compression the hotter sections of the specimen will undergo greater deformation, the cross sectional area of the specimen will increase and the current density will decrease.) A major advantage of this test method is the absence of any limitations on the heating temperature. Furthermore, it not only eliminates the adverse effect of friction forces on the uniformity of deformation but also preserves the strength of the press tools by preventing heat transfer from the test specimen to the tools. Orig. art. has: 6 figures.

SUB CODE: 13, 11/ SUBM DATE: 27Sep66/ ORIG REF: 003/

Card 2/2

ACC NR: AT7004426 (A) SOURCE CODE: UR/0000/66/000/000/0192/0195

AUTHOR: Pavlov, I. M. (Corresponding member AN SSSR); Mekhed, G. N.; Van Yu-Min

ORG: none

TITLE: Study of the effect of rolling temperature on the mechanical properties of high-strength steels following thermomechanical treatment

SOURCE: AN SSSR. Institut metallurgii. Napryazhennoye sostoyaniye i plastichnost' pri deformirovanii metallov (Stress condition and plasticity during metal deformation). Moscow, Izd-vo Nauka, 1966, 192-195

TOPIC TAGS: steel, high strength steel, mechanical property, thermomechanical treatment/45KhNT steel, 60KhNYu steel

ABSTRACT: The mechanical properties of 45KhNT and 60KhNYu experimental high-strength steels subjected to a combination treatment of plastic deformation and quenching and tempering have been investigated. It was shown that these steels are characterized by a highly stable zone of supercooled austenite:

Card 1/2 UDC: 669.1

ACC NR: AT7004426

500—600 C range for 45KhNT and above 400 C for 60KhNYu. Following thermomechanical treatment the mechanical properties of these steels are affected greatly by the rolling and tempering temperatures. An increase in rolling temperature decreases the hardness and strength of the steels and increases the plasticity. The optimum temperature for thermomechanical treatment is 500 C for 45KhNT and 500—600 C for 60KhNYu steel. Orig. art. has: 6 figures.

[AM]

SUB CODE: 11, 13/SUBM DATE: 27Sep66/ORIG REF: 005/OTH REF: 002/

Card 2/2

ACC NR: AT7004428 (A) SOURCE CODE: UR/0000/66/000/000/0199/0202

AUTHOR: Pavlov, I.M. (Corresponding member AN SSSR); Mekhed, G.N.; Van Y -Min

ORG: none

TITLE: Effect of the roller surface temperature and rolling speed in low-temperature thermomechanical treatment on the mechanical properties of 45KhNT and 60KhNYu steels

SOURCE: AN SSSR. Institut metallurgii. Napryazhennoye sostoyaniye i plastichnost' pri deformirovanii metallov (Stress condition and plasticity during metal deformation). Moscow, Izd-vo Nauka, 1966, 199-202

TOPIC TAGS: HOT ROLLING, TENSILE STRENGTH, ELONGATION, high strength steel, ~~steel~~ thermomechanical treatment, ~~low temperature thermomechanical treatment, steel property,~~ low alloy steel/45KhNT steel, 60KhNYu steel

ABSTRACT: Specimens of 45KhNT and 60KhNYu steels, oil-quenched and tempered at 200°C for 1.5 hr, were rolled at 500°C with a 60% reduction at a constant speed of 1.25 m/sec and a roller surface temperature of 20, 150 and 250—260°C. Increasing the roller surface temperature from 20 to 250°C had a very slight effect on the tensile and yield strengths and

Card 1/2 UDC: 669.1

ACC NR: AT7004428

hardness of 45 KhNT steel; however, the reduction of area increased from 11 to 22% and the elongation from 2.5 to 6%. Increasing the roller temperature from 20 to 250°C increased the tensile strength of 60KhNYu steel from 192—193 to 250 kg/mm^2, the reduction of area from 3.4 to 9.5%, and the elongation from 0.6 to 4.7%; however, the changes in the yield strength and hardness were insignificant. The high strength and ductility of 60KhNYu steel can be explained by a more homogeneous martensitic structure resulting from rolling with hot rollers. The steels were also rolled with a 40% reduction at a constant roller surface temperature of 250—260°C at a rolling speed varying from 0.75 to 2 m/sec. Rolling in the 0.75—1.25 m/sec range of rolling speed was found to be the most effective. It increased the tensile strength of 45KhNT steel from 220 to 230 kg/mm^2, the yield strength from 175 to 185 kg/mm^2, and the reduction of area from 20 to 24%, but had practically no effect on the steel hardness and elongation. Similarly, the tensile strength of 60KhNYu steel increased from 237 to 243 kg/mm^2, the yield strength from 163 to 171 kg/mm^2, the reduction of area from 6.5 to 7%, the elongation from 2.3 to 3.5% and the RC hardness from 60 to 61.5 units. Further increases in the rolling speed had practically no effect on the mechanical properties of 45KhNT and 60KhNYu steels under the investigated conditions of thermomechanical treatment. Orig. art. has: 6 figures. [MS]

SUB CODE: 11, 13/ SUBM DATE: 27Sep66/ ATD PRESS: 5116

Card 2/2

L 1114-67 EWT(m)/EWP(w)/EWP(t)/ETI SOURCE CODE: UR/2777/66/000/005/0169/0179
ACC NR: AR6023314

AUTHOR: Pavlov, I. M.; Meskhed, G. N.; ...

TITLE: Effect of temperature on the mechanical properties of iron-aluminum alloys

SOURCE: Ref. zh. Mashinostr mat konstr i raschet detal mashin. Gidroprivod, ...

REF SOURCE: Tr. Mosk. in-ta stali i splavov i Mosk. energ. in-ta, vyp. ..., ...
1965, 169-179

TOPIC TAGS: iron aluminum alloy, aluminum alloy property, ductility, ...

ABSTRACT: Fe-Al alloys were studied with aluminum concentrations of 8.0 ... 14.06 and 16.40% conditionally designated as Yu8, Yu12, Yu14 and Yu16 respectively. Alloys with an aluminum concentration of 12% or more have low ductility ... and a_k<1.3 kg/cm^2) and are brittle at room temperature. The mechanical properties of iron-aluminum alloys depend on temperature and aluminum concentration. There is a sharp increase in strength characteristics at 100-200°C. The alloys may be divided into two groups on the basis of σ_b as a function of temperature. Alloys in the first group (Yu8 and Yu12) show little change in σ_b (less than 4%). In the second group (Yu14 and Yu16) σ_b increases (up to 40%) as the temperature is raised. Alloys with

Card 1/2 UDC: ...

L 11254-67
ACC NR: AR6023314

...n aluminum concentration from 0 to 10.5% have two maxima on σ_k curves. ... the concentration of aluminum in the alloy is accompanied by a reduct... first maximum (from 32 to 10 kg/cm^2) with a shift toward higher temperatur... to 450°C). At 500°C, σ_p and δ are only slightly dependent on aluminum concentration and show similar values for Yu6, Yu12 and Yu14 alloys. [Translation of Abstract]

SUB CODE: 11

Card 2/2 JS

L 40328-66 EWT(m)/T/EWP(t)/ETI/EWP(k) IJP(c) JD/HM
ACC NR: AP6014112 (N) SOURCE CODE: UR/0370/65/000/006/0076/0079

AUTHORS: Pavlov, I. M. (Moscow); Mekhed, G. N. (Moscow); Suvorov, V. A. (Moscow); Tarasevich, Yu. F. (Moscow)

ORG: none

TITLE: Investigation of the hot-rolling process of iron-aluminum alloys

SOURCE: AN SSSR. Izvestiya. Metally, no. 6, 1965, 76-79

TOPIC TAGS: iron aluminum alloy, aluminum containing alloy, metal rolling, rolling mill, hot rolling / Yu8 iron aluminum alloy, Yu12 iron aluminum alloy, Yu14 iron aluminum alloy, Yu16 iron aluminum alloy, duo 240 rolling mill

ABSTRACT: The specific rolling pressure of iron-aluminum alloys Yu8, Yu12, Yu14, and Yu16 (containing 7.95, 11.55, 14.10 and 16.25% Al by weight respectively) was measured as a function of rolling temperature (300--800C) and compared with the rolling pressure for Armco iron. Specimens (4 x 20 x 100 mm) were cut from hot-rolled (1000--1050C) sheet and rolled on a duo 240 rolling mill at 0.63 m/sec in three passes (10% deformation during each pass). The results are shown in Fig. 1. It was found that the specific rolling pressure increases with aluminum content and decreases with rolling temperature. During the rolling of aluminum alloys having long-range order no significant difference in rolling pressure was found between rolling above and below the order-disorder transition temperature.

Card 1/2 UDC: 669.15'71-122.2

L 40328-66

ACC NR: AP6014112

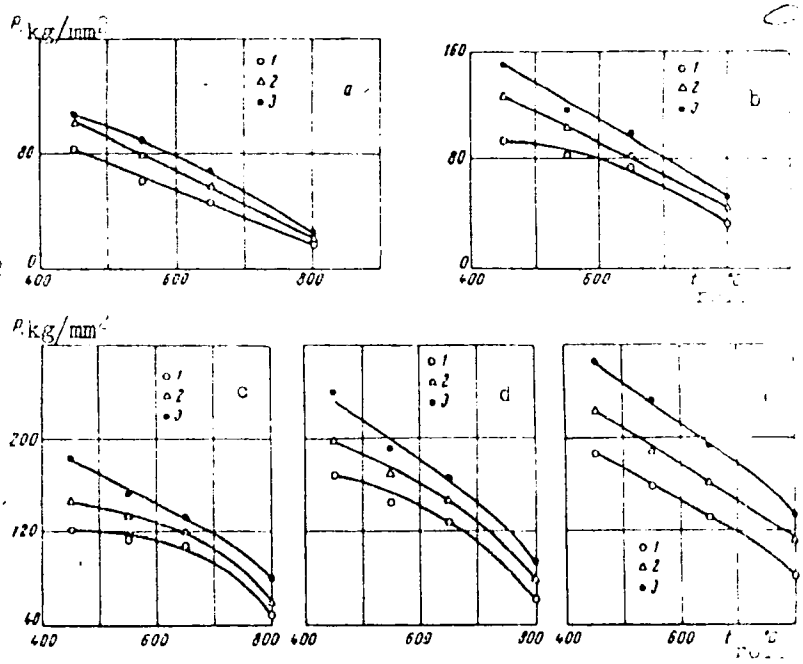


Fig. 1. Specific pressure as a function of rolling temperature for Armco iron (a) and alloys Yu8 (b), Yu12 (c), Yu14 (d), Yu16 (e).

Orig. art. has: 1 figure and 1 equation.

SUB CODE: 13/ SUBM DATE: 14Sep64/ ORIG REF: 011/ OTH REF: 007

Card 2/2

L 385 1-66 EWT(d)/EWT(m)/EWP(w)/EWP(v)/T/EWP(t)/ETI/EWP(k)/EWP(h)/EWP(l)

ACC NR: AT6012409 IJP(c) JD/HW/GD SOURCE CODE: UR/0000/65/000/000/0312/0316

AUTHORS: Pavlov, I. M.; Konstantinov, Ye. G.; Shelest, A. Ye.; Tarasevich, Yu. F.

ORG: none

TITLE: Several rolling conditions for titanium alloys

SOURCE: Soveshchaniye po metallokhimii, metallovedeniyu i primeneniyu titana i yego splavov, 6th. Novyye issledovaniya titanovykh splavov (New research on titanium alloys); trudy soveshchaniya. Moscow, Izd-vo Nauka, 1965, 312-316

TOPIC TAGS: FRICTION COEFFICIENT, metal rolling, titanium alloy, rolling mill, metal friction / VT1 titanium alloy, OT4 titanium alloy, VT6 titanium alloy, VT14 titanium alloy, VT15 titanium alloy, duo 200 rolling mill

ABSTRACT: The coefficient of external friction during rolling of rectangular titanium alloy slabs under a wide range of temperature and deformation conditions was investigated. Specimens (12 x 10 x 150 mm) of titanium alloys VT1, OT4, VT6, VT14, and VT15 were preheated to 500--1100C (at 100C intervals), rolled on a duo 200 rolling mill with relative reductions of 20, 40, and 60%. The forward flow and coefficient of friction were measured and tabulated for these rolling conditions. The coefficient of friction over the temperature interval 500--1100C was found to be $\approx$ 0.15, while the forward flow was found to vary considerably. Curves of the forward flow and friction coefficient as a function of strip width are presented for alloy VT6 (20 and 40%

Card 1/2

L 38561-66
ACC NR: AT6012409

deformation); both increase almost linearly with increasing width. An equation for finding the rolling torque on a single roll as a function of rolling parameters is derived. The results of the investigation can be used to determine rational rolling parameters for titanium alloys. Orig. art. has: 4 figures and 1 table.

SUB CODE: 11, 13/ SUBM DATE: 02Dec65/ ORIG REF: 003

Card 2/2

L 30368-66 EWP(k)/EWT(d)/EWT(m)/EWP(h)/T/EWP(l)/EWP(v)/EWP(t)/ETI IJP(c) JD/GD

ACC NR: AT6012386 SOURCE CODE: UR/0000/65/000/000/0163/0166

58
54
B+1

AUTHORS: Pavlov, I. M.; Shelest, A. Ye.

ORG: none

TITLE: Peculiarities of gas saturation of some titanium alloys

SOURCE: Soveshchaniye po metallokhimii, metallovedeniyu i primeneniyu titana i yego splavov, 6th. Novyye issledovaniya titanovykh splavov (New research on titanium alloys); trudy soveshchaniya. Moscow, Izd-vo Nauka, 1965, 163-166

TOPIC TAGS: titanium, HARDNESS, titanium alloy, gas absorption, plasticity, phase composition, gas diffusion, ~~temperature~~/ VT1 titanium, OT4-1 titanium alloy, OT4 titanium alloy, VT6 titanium alloy, VT14 titanium alloy, VT15 titanium alloy

ABSTRACT: The characteristics of gas saturation of titanium alloys are studied. The work is based on an earlier study by I. M. Pavlov, A. Ye. Shelest, and Ye. G. Konstantinov (Osobennosti okisleniya nekotorykh titanovykh splavov pri nagreve pered plasticheskoy deformatsiyey. Sb. Titan i yego splavy. Metallovedeniye titana, Izd-vo Nauka, 1964). Titanium alloys VT1, OT4-1, OT4, VT6, VT14, and VT15 were studied. The specimens were heated in an electric furnace to 800--1200C (every 100C) for 15, 30,

Card 1/2

Card 2/2

L 29920-66 EWP(k)/EWT(m)/T/EWP(w)/EWP(t)/ETI IJP(c) DJ/JD/HW/JG

ACC NR: AP6017300 (A, N) SOURCE CODE: UR/0136/66/000/005/0093/0094

56
B

AUTHOR: Krupin, A. V.; Pavlov, I. M.; Linetskiy, B. L.; Chernyshev, V. N.; Zarapin, Yu. L.; Starkov, V. N.; Korchagin, P. A.; Vinogradov, V. V.; Tyukalov, T. V.

ORG: none

TITLE: Rolling of tungsten and molybdenum under conditions of low partial pressures of oxygen

SOURCE: Tsvetnyye metally, no. 5, 1966, 93-94

TOPIC TAGS: tungsten, molybdenum, hot rolling, tungsten rolling, molybdenum rolling, vacuum rolling

ABSTRACT: Tungsten and molybdenum plates (8 x 40 x 150 mm) preforged or prerolled from sintered ingots were hot rolled in air, argon containing 0.03% O_2 and 0.01% N_2, or in a vacuum of 0.1—0.005 mm Hg. Tungsten was rolled at 1200, 1300, and 1450C with reductions of 10, 20, and 30% per pass; molybdenum was rolled at 950, 1050, and 1150C with reductions of 10, 20, 30, 50, and 55% per pass. A sharp increase in the roll pressure, torque, forward slip, and friction coefficient was observed with change from air atmosphere to a pressure of 0.1 mm Hg. This was caused by increased friction. Lowering the pressure from 0.1 to 0.005 mm Hg had little or no additional effect. Increasing the rolling temperature in vacuum of 0.01 mm Hg had an insignificant effect on the specific pressure in rolling molybdenum, but appreciably

Card 1/2 UDC: 669.27/.28:621.771

L 29920-66

ACC NR: AP6017300

decreased the specific pressure in rolling tungsten, e.g., from 74 at 1200C to 64 and 60 kg/mm^2 at 1300 and 1450C, respectively. The specific pressure increased with increasing reduction. In rolling tungsten in a vacuum of 0.1 mm Hg, increasing the reduction from 20 to 30% led to a specific pressure increase from 74 to 91 kg/mm^2 at 1200C and from 60 to 69 kg/mm^2 at 1450C. In rolling molybdenum the specific pressure increased from 44 to 96.5 kg/mm^2 with increasing reduction from 10 to 45% at 1050C. In vacuum rolling at high temperatures and reductions a sticking of metal to the rolls was observed. In rolling of tungsten at 1450C with a reduction of 35%, an intensive sticking resulted in splitting of metal. Little or no sticking was observed at 1200C. Noticeable sticking was observed in rolling molybdenum at 1150C. [MS]

SUB CODE: 11,13/ SUBM DATE: none/ ORIG REF: 001/ ATD PRESS: 5011

Card 2/2 UE

PAVLOV, I.M. (Moskva); MEKHED, G.N. (Moskva); SUVOROV, V.A. (Moskva); TARASEVICH, Yu.F. (Moskva)

Investigating the warm rolling of iron-aluminum alloys. Izv. AN SSSR. Met. no.6:76-79 N-D '65. (MIRA 19:1)

1. Submitted September 14, 1964.

L 3496-66 EWT(m)/EPF(c)/EWA(d)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) JD/HW/DJ

ACCESSION NR: AP5024864 UR/0136/65/000/010/0083/0086
669.2/.8:621.771.2

AUTHOR: Pavlov, I.M.; Koryagin, N.I.

TITLE: Natural conditions of roll bite during the rolling of multilayer metals

SOURCE: Tsvetnyye metally, no. 10, 1965, 83-86

TOPIC TAGS: metal rolling, metal friction, friction coefficient

ABSTRACT: Roll bite requires that the horizontal friction force exceed the force resisting the entry of metal in between the rolls. For metals whose surface in contact with the rolls have identical friction coefficients this can be described by a relatively simple formula, but for multi-layer metals a special formula is required; such a formula is derived by the author:

$$\frac{f_1+f_2}{2} \geq \tan\alpha \qquad (1)$$

Card 1/4

where f_1 is the friction coefficient of one metal surface, f_2 is the friction coefficient of the other metal surface, and α is the angle of bite. On this basis, it is shown that in the rolling of multilayer packets with contact surfaces having different friction coefficients, the maximum bite angle of the packet is roughly determined by the expression

$$\tan\frac{\beta_1+\beta_2}{2}\approx\tan\alpha \qquad (2)$$

where β, B_2, are the friction angles. Or, on replacing the friction angles with the maximum bite angles, we have

$$\frac{\alpha_1+\alpha_2}{2}\approx\alpha. \qquad (3)$$

It is further shown that in the case of a multilayer-metal billet, roll bite does not necessarily require the application of an external push. This is documented by

L 3496-66
ACCESSION NR: AP5024864

experiments with the cold rolling of two-layer (layers of 3 mm each) billets measuring 3x375x375, with reduction of area from 6 to 2.5 mm, i.e., with a bite angle of 6°10', by the following procedure: with the rolls halted, the billets were placed in a position ready for bite (a), whereupon the rolls were put in motion and roll bite took place (b) (see Fig. 1 of the Enclosure). This experiment shows that it is sufficient for the layers of the metal to come into contact with the rolls in order to immediately generate the force R sufficient to form a friction force capable of entraining the billet into the zone of deformation without the application of an external push. The second part of the experiments pertained to the determination of bite angles during the hot, cold, and combined hot-cold rolling of two- and multi-layer metals with the rolls treated with different solutions or lubricants. The findings confirmed the validity of formula (3), i.e., the maximum bite angle of a multilayer packet with different friction coefficients of the packet's components is determined with sufficient accuracy according to their respective bite angles. Orig. art. has: 1 figure, and 5 formulas.

ASSOCIATION: none
SUBMITTED: 00
NO REF SOV: 007
ENCL: 01
OTHER: 000
SUB CODE: MM, IE

Card 3/4

L 3496-66

ACCESSION NR: AP5024864

ENCLOSURE: 01

0

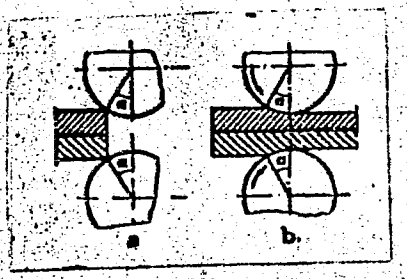


Fig. 1. Roll bite in the case of multilayer packet without the application of an external push

Card 4/4

PAVLOV, I.M.; AVRUNIN, P.M.

Investigating the longitudinal and transverse effectiveness of deformation during rolling. Izv. vys. ucheb. zav.; chern. met. 8 no.9:92-97 '65. (MIRA 18:9)

1. Moskovskiy institut stali i splavov.

PAVLOV, I.M. (Moskva)

Conditions for plastic deformation in connection with certain vector relations. Izv. AN SSSR. Met. no.3:89-100 My-Je '65.

Physical conditions for plastic deformation in the aspect of certain general correlations between motion and friction. Ibid.:73-8[illegible] '65. (MIRA 18:7)

PAVLOV, I.M. (Moskva)

Physical conditions for the rolling process. Izv. AN SSSR. Met. i gor. delo no.6:10-18 N-D '64. (MIRA 18:2)

PAVLOV, I.M. (Moskva), MEKHED, G.N. (Moskva), SUVOROV, V.A. (Moskva)

Mechanical properties of binary iron-aluminum alloys. Izv. AN SSSR, Met. no.1:136-140 Ja-F '63. (MIRA 16:2)

PAVLOV, I.M.; MEKHED, G.N.; SUVOROV, V.A.

Classifying the processes of working metals by pressure.
TSvet. met. 38 no.2:69 F '65. (IRA 18:3)

PAVLOV, I.M.; KOROLEV, A.A.; ILKA IOAN; CHERNYSHEV, V.N.

Device for the investigating of the asymmetrical process of longitudinal rolling. Izv. vys. ucheb. zav.; chern. met. 7 no.11:105-111 '64. (MIRA 17:12)

1. Moskovskiy institut stali i splavov.

L 42964-65 EWT(d)/EWT(m)/EPF(n)-2/EWG(m)/EWA(d)/EWP(v)/EPR/EWP(t)/EWP(k)/EWP(h)/
EWP(z)/EWP(b)/EWP(l)/EWA(c) Pf-4/Ps-4/Pu-4 IJP(c) JD/HW/JG
ACCESSION NR: AP5008388 S/0148/65/000/003/0089/0093

AUTHOR: Krupin, A. V.; Pavlov, I. M.; Chernyshev, V. N.; Bogolyubov, V. S.; Linetskiy, B. L.

TITLE: The vacuum rolling mill 210

SOURCE: IVUZ. Chernaya metallurgiya, no. 3, 1965, 89-93

TOPIC TAGS: vacuum rolling mill, rolling mill equipment, rolling mill 210

ABSTRACT: The vacuum rolling plant 210 has been designed and built at the Moscow Institute for Steel and Alloys. The plant consists of a rolling mill and heat-treating furnaces enclosed in a common vacuum chamber, which makes it possible to heat, roll, and heat-treat metals and alloys either in a vacuum or in a protective atmosphere in one continuous operation. The one-stand, two-high reversible mill has rolls 210 mm in diameter and 340 mm long. The maximum permissible roll pressure is 100 tons, and the maximum roll opening is 50 mm. The mill is driven by a 22-kw, d-c motor at speeds of 400 to 1000 rpm. The rolls can be preheated if necessary. The maximum temperature in

Card 1/2

L 42964-65

ACCESSION NR: AP5008388

one furnace is 1650C and in another, 1300C. The vacuum chamber is 1020 mm in diameter and is made of a steel plate 10 mm thick. The vacuum system can evacuate the chamber to $1 \cdot 10^{-2}$—$1 \cdot 10^{-5}$ mm Hg. The mill has been used to roll refractory metals (V, Nb, Ta, Zr, Mo, and W) and metal-to-metal laminates (e.g., titanium alloy-bronze, titanium alloy-stainless steel, titanium alloy-niobium-stainless steel, titanium alloy-tantalum-stainless steel). Orig. art. has: 1 figure. [AZ]

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow Institute for Steel and Alloys)

SUBMITTED: 25Sep64 ENCL: 00 SUB CODE:

NO REF SOV: 000 OTHER: 000 ATD PRESS: 3236

Card 2/2

PAVLOV, I.M.

The question of the physical nature of tensor representations in the theory of plasticity. Izv. vys. ucheb. zav.; chern. met. 7 no.12:181-186 '64 (MIRA 18:1)

1. Moskovskiy institut stali i splavov.

L 45062-65 EWT(m)/EPF(n)-2/EWA(d)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) Pf-4/
Pu-4 IJP(c) MJW/JD/HW/JG

ACCESSION NR: AR5008958 S/0277/65/000/001/0025/0025

43
41
B

SOURCE: Ref. zh. Mashinostroitel'nyye materialy, konstruktsii i raschet detaley mashin. Otd. vyp., Abs. 1.48.125

AUTHOR: Pavlov, I. M.; Danil'chenko, A. N.; Rastegayev, M. V.; Mezis, V. Ya.; Napalkov, L. A.; Kuleshov, M. Ya.

TITLE: A study of plasticity and microstructure of VM-2 alloy when deformed by upsetting

18 19

CITED SOURCE: Tr. Mosk. in-ta metallurgii, Mosk. energ. in-ta i Mosk. in-ta stali i splavov vyp. 44, 1963, 256-263

TOPIC TAGS: molybdenum alloy, alloy plasticity, alloy microstructure, hot upsetting, bulge test, optimum deformation temperature, VM-2 alloy

TRANSLATION: The report gives the results of a study of the plasticity and microstructure of VM-2 molybdenum alloy after upsetting. The alloy's mechanical properties at room temperature were: $\sigma_{0.2} = 27.2 - 28.0$ kg/mm^2, $S_{cr} = 37.0 - 41.0$ kg/mm^2, $\delta = 6-10\%$, $\psi = 5-8.5\%$. Samples with diameter = 20 mm were bulge-tested on a 450 kg-m vertical impact tester with a max. ram drop rate of 10 m/sec. Billets were annealed at 1400C prior to shaping into cylindrical samples.

Card 1/2

L 45062-65

ACCESSION NR: AR5008958

It was found that commerical grades of VM-2 alloy exhibit adequate plasticity in a pressed and annealed state. The samples were upset along the axis of symmetry to levels of 70% without the development of cracks at 800-1400C. Cracks were also absent in diameter reduction (spread) to max. deformation of 55-58% at 800 or 900C. They occurred only when upsetting at 500-700C. A comparison of effective pressure values for open end upsetting at 900-1200C has shown that this characteristic reaches levels higher by 10-40% for VM-2 alloy than for steels Kh17N2 and 30KhGSA, other conditions being equal. Deformation temperatures of 1200 to 900C are recommended in relation to alloy VM-2. Bibl. with 3 titles; 4 illustrations. G. Mekhed

SUB CODE: MM ENCL: 00

Card 2/2

L 45459-65 EWT(m)/EWA(d)/EPR/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) Pf-4/Ps-4
IJP(c) MJW/JD/HW
ACCESSION NR: AP5009269 UR/0370/65/000/001/0136/0140

AUTHOR: Pavlov, I. M. (Moscow); Mekhed, G.N. (Moscow); Suvorov, V.A. (Moscow)

TITLE: Mechanical properties of binary iron-aluminum alloys

SOURCE: AN SSSR. Izvestiya. Metally, no. 1, 1965, 136-140

TOPIC TAGS: alloy mechanical property, binary alloy, iron alloy, aluminum alloy, alloy plasticity

ABSTRACT: This paper is devoted to a study of the temperature dependence of the mechanical properties of Fe-Al alloys containing 8, 11.5, 14, and 16.5% Al and designated Yu8, Yu12, Yu14, and Yu16, respectively. The alloys were prepared in a magnesite crucible by fusion in a vacuum induction furnace of the TsNIICHM experimental plant, using armco iron and AV000 aluminum. All the alloys except Yu8 had a low technological plasticity ($\delta < 5\%$) at room temperature. The strength of all the alloys was between 48 and 68 kg/mm^2. It was found that as the temperature rose from 25 to 300-400 C, after a certain dip, a sharp rise in the ultimate strength was observed, particularly in alloys Yu14 and Yu16. The maximum strength in Yu8 and Yu12 was observed at 300C, and in Yu14 and Yu16, at 400C; the greatest

Card 1/2

L 45459-65

ACCESSION NR: AP5009269

strength was displayed by alloy Yul4, which had an Fe_3Al superstructure. An increase in the plasticity of the Fe-Al alloys with rising temperature promotes an increase in strength. The decline in the strength of all the alloys studied, starting at 400-450C, is due to the start of the process of disorganization and the disappearance of long-range order; the plasticity minimum in this case corresponds to the temperature of the order-disorder transition. The plastic properties or Fe-Al alloys are best described by the value of the elongation per unit length. Orig. art. has: 1 table and 4 figures.

ASSOCIATION: None

SUBMITTED: 26Mar64 ENCL: 00 SUB CODE: MM

NO REF SOV: 005 OTHER: 013

Card 2/2

PAVLOV, I.M. (Szovjetunio)

Physical conditions of rolling process. Technika 9 no.2:2 F '65.

PAVLOV, I.M.; KORYAGIN, N.I.

Natural conditions of bite in the rolling of multilayer metals. TSvet.met. 38 no.10:83-86 O '65.

(MIRA 18:12)

L 22347-66 EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(k) IJP(c) JD/HW

ACC NR: AP6012728 SOURCE CODE: UR/0136/66/000/004/0072/0073

AUTHOR: Pavlov, I. M.; Burkhanov, S. F.; Shor, E. R.; Osipov, E. Ye.; Chinenov, A. M.

ORG: none

TITLE: Study of resistance to deformation during cold rolling of VT14, VT15, and VT16 alloy strips

SOURCE: Tsvetnyye metally, no. 4, 1966, 72-73

TOPIC TAGS: titanium, titanium alloy, titanium alloy strip, strip rolling, cold rolling, titanium clad alloy/VT14 alloy, VT15 alloy, VT16 alloy

ABSTRACT: The roll pressure and resistance to deformation during cold rolling of clad and unclad VT14, VT15, and VT16 titanium-alloy strips has been investigated. Unclad 1.8 x 250 x 500 mm strips were rolled into strip 1 mm thick at a rate of 30—90 m/min with a reduction of 3—6% in the first and 1—2% in the final passes. All the alloys were relatively easily reduced in the first passes, but in the last passes the edges of VT14 alloy strip began to tear at 40% total reduction. Rolling of this alloy was accompanied by intensive strain hardening. VT15 alloy had less resistance to deformation than VT14 alloy. The lowest pressures were required for VT16 alloy. The average pressure at 30% reduction was 230 kg/mm^2 for VT14 alloy, 220 kg/mm^2 for VT15 alloy, and 180 kg/mm^2 for VT16 alloy. Alloy strips clad on each side with VT1 commercial-grade titanium were easily reduced to 30—40% of the

Card 1/2 UDC: 669.295-124.2:620.1

L 22347-66

ACC NR: AP6012728 2

initial thickness with the average pressure reduced by 20%. Resistance to deformation of clad and vacuum-annealed VT14 alloy strips decreased by 30%. Thus, VT16 alloy has the best technological properties. Cladding significantly reduced resistance to deformation. Orig. art. has: 2 figures. [AZ]

SUB CODE: 11, 13/ SUBM DATE: none/ ORIG REF: 001/ ATD PRESS: 4242

Card 2/2 dda

L 45294-66 EWP(e)/EWP(v)/EWT(d)/EWI(m)/T/EWP(t)/ETI/EWP(k)/EWP(h)/EWP(l) IJP(c)
ACC NR: AR6017489 JD/HW/JG/AT/WH SOURCE CODE: UR/0137/66/000/001/D024/D024

AUTHORS: Pavlov, I. M.; Krupin, A. V.; Chernyshev, V. N.; Bogolyubov, V. S.; Linetskiy, B. L.

67
B

TITLE: Devices for working refractory metals in vacuum and in inert media

SOURCE: Ref. zh. Metallurgiya, Abs. 1D170

REF SOURCE: Tr. Mosk. in-ta stali i splavov i Mosk. energ. in-ta, vyp. 61, ch. 2, 1965, 89-94

TOPIC TAGS: physical metallurgy, metal rolling, rolling mill, refractory metal

ABSTRACT: Problems associated with rolling some metals in a vacuum are discussed. Special types of mills used in vacuum rolling and the technique of rolling some refractory metals are described. A. Leont'ev [Translation of abstract]

SUB CODE: 11

Card 1/1

UDC: 669.621.771.27

L 45436-66 EWT(m)/EWP(w)/T/EWP(t)/ETI/EWP(k) IJP(c) JD/HW/JH

ACC NR: AP6019767 (A) SOURCE CODE: UR/0370/66/000/003/0090/0093

AUTHOR: Pavlov, I. M. (Moscow); Mekhed, G. N. (Moscow); Suvorov, V. A. (Moscow)

ORG: none

TITLE: Effect of roll temperature on specific pressure in the rolling of iron-aluminum alloys

SOURCE: AN SSSR. Izvestiya. Metally, no. 3, 1966, 90-93

TOPIC TAGS: rolling mill, hot rolling, cold rolling, chemical composition, iron aluminum alloy, temperature effect

ABSTRACT: The problem of reducing the cooling effect of rolls on metal being rolled by preheating the rolls to a given temperature is discussed. A gas-fired Duo 240 mill was used to roll a series of ordered, magnetic Fe-Al alloys (Yu8 7.95% Al, Yu12 11.55% Al, Yu14 14.10% Al, Yu16 16.25% Al), all of which, with the exception of Yu8, have long-range order. These alloys are body-centered cubic in structure and those alloys with more than 12% Al are brittle at room temperature and cannot be cold rolled. Samples of Armco iron were also rolled for purposes of comparison. Two series of samples were rolled at a given temperature in two stages; one series on cold rolls, and the other on rolls heated to 250°C. From plotted data it was noted that specific pressures were higher for cold rolls. The magnitude of specific pressure lowering for the Fe-Al alloys on preheated rolls, as compared with cold rolls, depended on aluminum content, and is explained by the different values for the friction coefficients for

Card 1/2 UDC: 621.771.001

L 45436-66

ACC NR: AP6019767

differing aluminum content and by the abrupt cooling of the rolled metal on cold rolls. Physical properties of the surface layers, and differences in chemical composition of scale, lead to change in friction coefficients. The data cited make it quite evident that warm rolling of Fe-Al alloys on hot rolls significantly reduces the degree to which they are strengthened. Magnitudes of specific pressures obtained in the rolling of Yu12, Yu14, and Yu16 alloys on rolls heated to 250°C after the third pass were almost the same as those for the alloys after the second pass when processed on cold rolls. The rolling of metal on hot rolls makes it possible to reduce the number of passes required in rolling Fe-Al alloys. Roll wear is decreased, an important factor in the rolling of these alloys. Org. art. has: 5 sets of curves.

SUB CODE: 11, 13/ SUBM DATE: 31 May 65 / ORIG REF: 010

Card 2/2

L 07815-67 EWT(m)/EWP(t)/ETI/EWP(k) IJP(c) FDN/JD/IW

ACC NR: AR6017480 SOURCE CODE: UR/0137/66/000/001/D007/D008

AUTHOR: Pavlov, V. M.; Konstantinov, Ye. G.; Shelest, A. Ye.; Tarasevich, Yu. F.

TITLE: Conditions for hot and warm rolling of some titanium alloys 28 B

SOURCE: Ref. zh. Metallurgiya, Abs. 1D42

REF SOURCE: Tr. Mosk. in-ta stali i splavov i Mosk energ. in-ta, vyp. 61, ch. 1, 1965, 181-193

TOPIC TAGS: hot rolling, warm rolling, titanium alloy

ABSTRACT: It was found during this investigation that an increase in reduction (with H=const) increases the widening index for all alloys studied, where widening is basically due to barrel distortion. Due to the narrow width of the specimens under the conditions of this investigation, transverse deformation $\Psi=B_2/B_1$ was greater than longitudinal deformation $\mu=L_2/L_1$ in nearly all cases, which corresponded to the particular conditions for the stressed state of the metal at the source of deformation. An increase in reduction resulted chiefly in development of transverse deformation relative to drawing deformation. A. Leont'yev. [Translation of abstract]

SUB CODE: 13, 11

Card 1/1 mc UDC: 621.771.001

L 07813-67 EWT(m)/EWP(w)/EWP(t)/ETI IJP(c) JD/JH

ACC NR: AR6017493 SOURCE CODE: UR/0137/66/000/001/I071/I072

AUTHOR: Pavlov, I. M.; Mekhed, G. N.; Suvorov, V. A.

TITLE: Effect of temperature on the mechanical properties of iron-aluminum alloys

SOURCE: Ref. zh. Metallurgiya, Abs. 11479

REF SOURCE: Tr. Mosk. in-ta stali i splavov i Mosk. energ. in-ta, vyp. 61, ch. 1, 1965, 169-179

TOPIC TAGS: iron aluminum alloy, metal stress, solid mechanical property

ABSTRACT: Yu8, Yul2, Yul4 and Yul6 Fe-Al alloys were studied with aluminum concentrations of 8.0, 11.5, 14.0 and 16.5% respectively. The alloys have low ductility ($\delta<5\%$, $\psi<5\%$, $a_k<1.3$ kg/cm^2) at room temperature. The mechanical properties depend on temperature and aluminum concentration. Strength increases sharply at 100-200°C. The alloys studied were divided into two groups according to the nature of variation in σ_b with respect to temperature. In the first group are Yu8 and Yul2 which show little change in σ_b(<4%). In the second group are Yul4 and Yul6 which show a considerable increase in σ_b(up to 40%) as temperature is raised. Alloys with 8-16.5% aluminum concentration have two maxima on curves for a_k as a function of temperature. As the

Card 1/2 UDC: 669.15'71

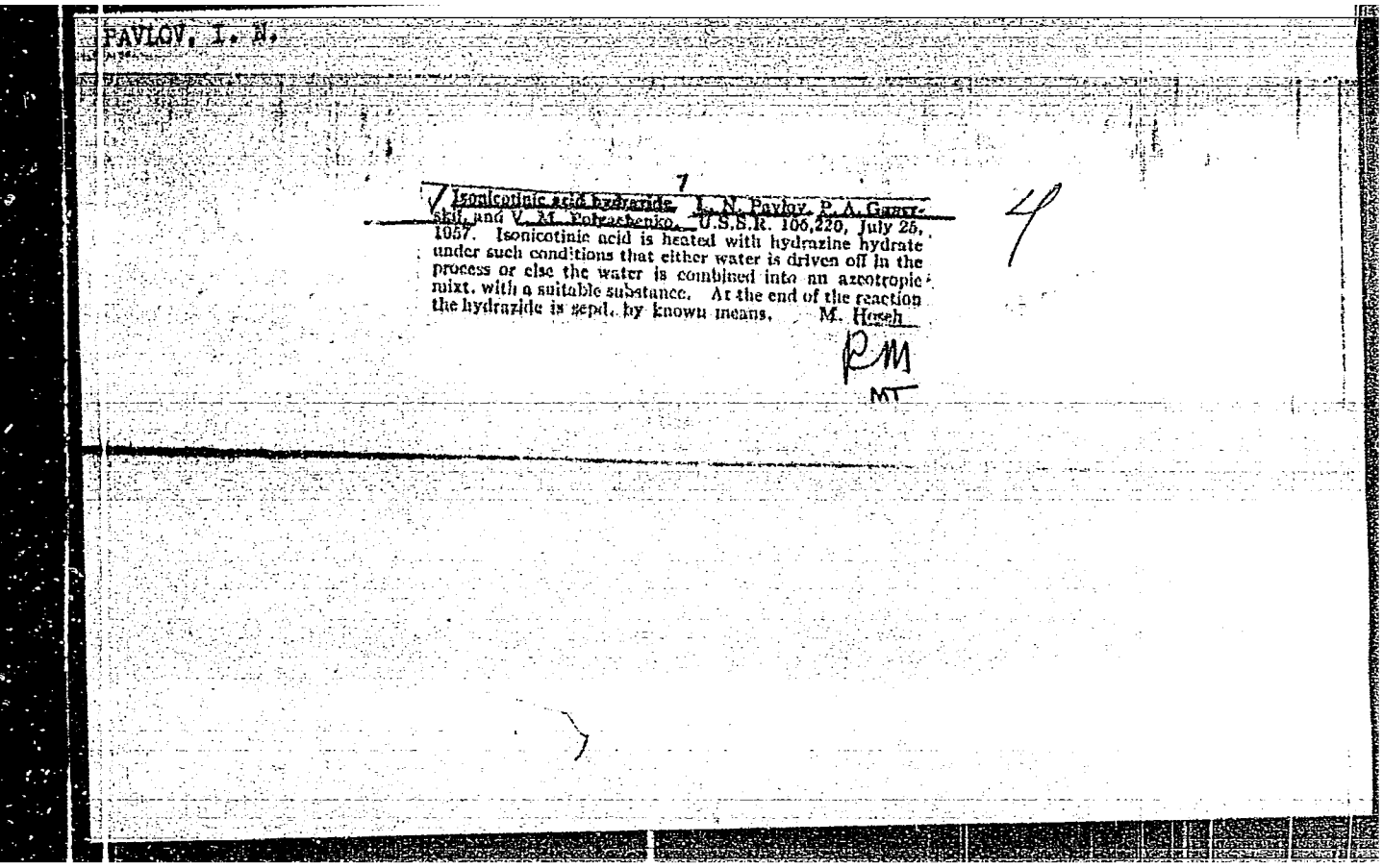
L 07813-67

ACC NR: AR6017493

aluminum concentration in the alloy is increased the first maximum is reduced (from 32 to 10 kg/cm^2) and shifted toward higher temperatures (from 200 to 450°C). At 800°C, σ_b and δ are only slightly dependent on aluminum concentration. From the summary, [Translation of abstract]

SUB CODE: 11

Cord 2/2 mc



PAVLOV, I. N.

7

Isonicotinic acid hydrazide. I. N. Pavlov, P. A. Gurevskii, and V. M. Potrachenko. U.S.S.R. 106,220, July 25, 1957. Isonicotinic acid is heated with hydrazine hydrate under such conditions that either water is driven off in the process or else the water is combined into an azeotropic mixt. with a suitable substance. At the end of the reaction the hydrazide is sepd. by known means. M. Hoseh

4

RM

MT

PAVLOV, I.N. [deceased]; PROKHOROV, S.P.; SKVORTSOV, G.G.; LOSEV, F.I.. Prinimali uchastiye: ROMANOVSKAYA, L.I.; KISSIN, I.G.; KULIBABA, F.V.. FILIPPOVA, B.S., red.; IVANOVA, A.G., tekhn.red.

[Iron ore deposits in the Kursk Magnetic Anomaly from the point of view of hydrogeology and engineering geology] Gidrogeologicheskie i inzhenerno-geologicheskie usloviia zhelezorudnykh mestorozhdenii Kurskoi magnitnoi anomalii. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po geol. i okhrane nedr, 1959. 271 p. (MIRA 13:3)

(Kursk Magnetic Anomaly--Iron ores)

PAVLOV, I. N.[deceased]

Principles of the classification of mineral deposits based on the hydrogeology and engineering geology. Vop. gidrogeol. i inzh. geol. no.20:66-70 '62. (MIRA 16:4)

(Ore deposits--Classification)

1. PAVLOV, I. P.

2. USSR (600)

4. Feeding and Feeding Stuffs - Analysis

7. Yield and nutritive value of green fodder from a mixture of vetch and oats at different stages of development. Sov. zootekh. 7/No.3,1952. Kandidat Sel'skodhozyatstvennykh Nauk Vsesoyuznyy Nauchno-Issledovatel'skiy Institut Kormleniya

9. Monthly List of Russian Accessions, Library of Congress, June 1952. Unclassified
Sel'skokhozyaystvennykh Zhivotnykh

PAVLOV, I. P.

Weeds

Wild oats and ways of fighting them; Sov. agron. 10 No. 3, 1952.

9. Monthly List of Russian Accessions, Library of Congress, May 1952. 1993, Uncl.

PAVLOV, I. P.

13559* (Increasing Nutrition Value of Grasses.) Povyshenie pitatel'nosti kormovykh trav. I. P. Pavlov. *Dostizhenila Nauki i Peredovogo Opyta v Sel'skom Khozyaistve*, 1954, no. 6, June, p. 14-15.
Effect of fertilizers on protein content of vetch-oat hay. Tables.

PAVLOV, I.P., kandidat sel'skokhozyaystvennykh nauk.

Mineral substances in grasses. Nauka i zhizn' 22 no.12:49 D '55. (MLRA 9:2)

(Minerals in plants)

M

Country : USSR
Category: Cultivated Plants Grains.

Abs Jour: RZhBiol., No 11, 1958, No 48871

Author : Pavlov, I.P.
Inst : Sci. Res. Inst of Foodstuffs for Agricultural Animals.
Title : Corn in the [illegible]n-Chernozem Belt.

Orig Pub: Vestn. s.-[illegible] nauki, 1956, No 3, 55-64

Abstract: This article describes the results of experiments on growing the following corn varieties: Sterling Krasnodarskiy, Krasnodarskaya 1/49, L[illegible]g Kubanskiy and Moskovskaya Populyatsiya. The experiments were conducted during 1954-1955 at the All-Union Scientific Research Institute of Foodstuffs for Agricultural Animals (near Moscow). The early sowings of corn

Card : 1/3

M-28

M

Country : USSR
Category: Cultivated Plants. Grains.

Abs Jour: RZhBiol., N 11, 1958, No 48871

(first half of May) in the non-chernozem zone of USSR are quite feasible even if the temperature of the soil at the depth of 8 cm is below 10c. Along with this, it is necessary that the section be well treated with organic fertilizers and that it be sheltered from the north and northeastern winds. In early sowing, it is recommended that the seeds be treated with Granosan (ethylmercurochloride) and hexachlorane, and not sown deeply. The highest yield of the green mass (together with the cobs) was 540 centners/ha was obtained from Sterling variety in 1955 The greatest yield of cobs - 37 1 centners/ha - was obtained from Moskovskaya Populyat-

Card : 2/3

Country : USSR
Category: Cultivated Plants Grains.

M

Abs Jour: RZhBiol., No. , 1958, No 48871

siya. June corn sowings are expedient for green feed and for ensilage. Under the condition of the non-chernozem belt, the corn varieties of intermediate and late maturity produce the highest yield of feed substances from one hectare at the end of September, and a much lower yield if harvesting takes place before September 20. -- G.N. Chernov

Card : 3/3

PAVLOV, I.P., kandidat sel'skokhozyaystvennykh nauk.

Comparative evaluation of winter rye and a mixture of perennial grasses as early spring supplementary cattle feed in the forest-meadow zone of the U.S.S.R. Trudy VNIIK 3:524-530 '56.
(Cattle--Feeding and feeding stuffs) (MLRA 10:4)
(Rye) (Grasses)

PAVLOV, I.P., kandidat sel'skokhozyaystvennykh nauk.

Increasing the mineral content of annual and perennial forage grasses. Trudy VNIIK 3:531-537 '56. (MLRA 10:4)
(Grasses) (Minerals in plants) (Feeding and feeding stuffs)

USSR/Soil Science. Mineral Fertilizers. I-5

Abs Jour: Referat Zh-Biol., No 6, 25 March, 1957, 22511

Author : Pavlov, I.P.
Inst :
Title : The Effect of Mineral Fertilizers on Fodder Quality of Annual Grasses.

Orig Pub: Tr. Vses. n.-i. in-t kormleniya s.-kh. zhivotnikh, 1956, 3, 538-542.

Abstract: The All-Union Institute of fodder for farm animals conducted a number of field tests to study the effect of mineral fertilizers on the yield of annual grasses and on the content of nutrient substances in several grass mixtures of votch-oats, vetchling-oats, peliuska-oats and winter rye for green fodder on its experimental farm and in the imeni Chkalov collective farm of Podolsk rayon in the Moscow oblast'. The experimental plan: control (without fertilizer); P 60 kg/hectare; PK 60 kg/

Card : 1/2

USSR/Soil Science. Mineral Fertilizers.

Abs Jour: Referat Zh-Biol., No 6, 25 March, 1957, 22511

I-5

hectare; NPK 60 kg/hectare. It was established that of all the tested mixtures, only the complete mineral fertilizers yield a considerable crop increase (up to 63%) and increase their protein content. P and K without nitrogenous fertilizers show no effect or a very insignificant one on increasing grass productivity.

Card : 2/2

PAVLOV, I.P., kandidat sel'skokhozyaystvennykh nauk.

Increasing the food value of field pea-oat mixtures. Trudy VNIIK 3:543-549 '56. (MLRA 10:4)
(Field pea) (Oats) (Feeding and feeding stuffs)

PAVLOV, I.P., kandidat sel'skokhozyaystvennykh nauk.

Increasing the nutritiousness of a vetch-oat green fodder mixture and the amount of nutrients harvested. Trudy VNIIK 3:550-558 '56.
(Vetch) (Oats) (Feeding and feeding stuffs) (MLRA 10:4)

Pavlov, I. P.

The influence of fertilizing meadows on the content of nutrients in the hay. I. P. Pavlov. *Udobrenie i Urozhai* 1, No. 6, 48-51(1956).—A report on the effectiveness of NPK on yield, protein, fat, cellulose, Ca, and P content of vetch-oat hay mixt. and a mixt. of grasses. Fall and spring dressings of meadow give best results. I. S. Ioffe

USSR / Cultivated Plants. Fodders. M-4

Abs Jour: Ref Zhur-Biol., No 6, 1958, 25095

Author : Pavlov, I. P.
Inst : The All-Union Institute for Feeding Agricultural Livestock
Title : The Effect of Corn on the Subsequent Vetch-Oats Mixture Crop

Orig Pub: Kukuruza, 1957, No 4, 37-39

Abstract: The All-Union Institute for Agricultural Livestock compared in 1955 the effect of corn and perennial meadow grass mixtures in the second year of use. The vetch-ats mixture's green stuff yield totaled 195.2 after the corn, and 148 centners per ha. after meadow grasses. -- B. K. Flerov

Card 1/1

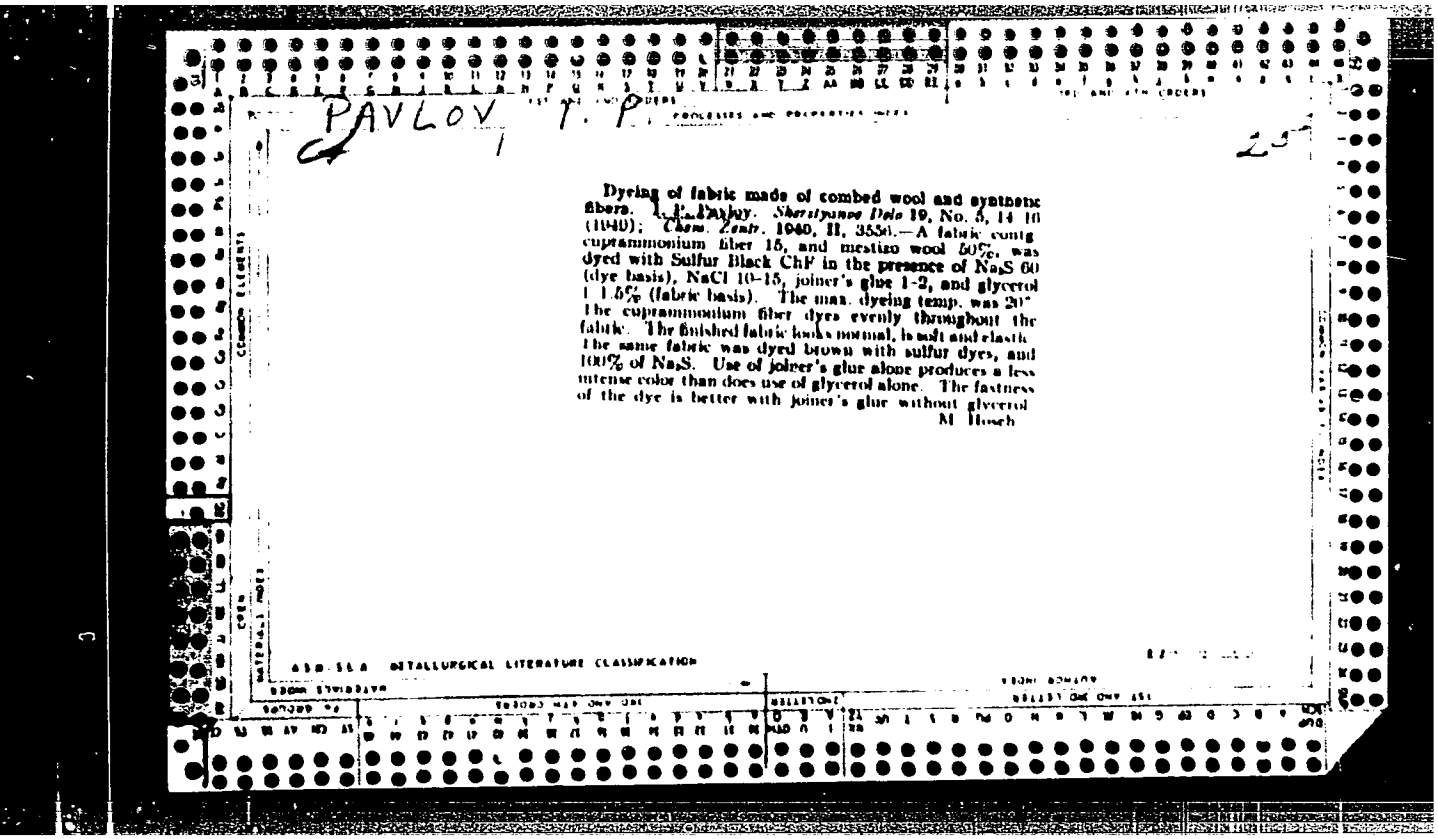
PAVLOV, I.P., kand. sel'skokhozyaystvennykh nauk

Increasing the amount of protein and other nutritive substances in m mixed perennial grasses by selecting grass mixture components and by mowing at the optimal time. Dokl. Akad. sel'khoz. 23 no.3:11-16 '58. (MIRA 11:4)

1.Vsesoyuznyy nauchno-issledovatel'skiy institut zhivotnovodstva. Predstavlena akademikom I.V. Larinym.
(Grasses)

VARTANOV, S.Kh.; PAVLOV, I.F., SERGEYEV, A.I.

Mobile rig for drilling wells in frozen ground. Gaz. prom. 10 no.9:57 '65. (MIRA 18:11)



PAVLOV, T. P.

Dyeing of fabric made of combed wool and synthetic fibers. T. P. Pavlov. *Sherstyanoe Delo* 19, No. 5, 14-16 (1940); *Chem. Zentr.* 1940, II, 3556.—A fabric contg cuprammonium fiber 15, and mestizo wool 50%, was dyed with Sulfur Black ChF in the presence of Na_2S 60 (dye basis), NaCl 10–15, joiner's glue 1–2, and glycerol 1–1.5% (fabric basis). The max. dyeing temp. was 20°. The cuprammonium fiber dyes evenly throughout the fabric. The finished fabric looks normal, is soft and elastic. The same fabric was dyed brown with sulfur dyes, and 100% of Na_2S. Use of joiner's glue alone produces a less intense color than does use of glycerol alone. The fastness of the dye is better with joiner's glue without glycerol.
M. Hosch

PAVLOV, I. P.

26628 (Peredovaya). Stomatologiya, 1949, No. 3, s. 3-5, s. Portr.

SO: LETOPIS' NO. 35, 1949

PAVLOV, I. P.

PAVLOV, I. P. -- "Silov p-Groups of Classic Groups Over Simple Fields of Characteristic R," Sub 2d Apr 52, Moscow Oblast Pedagogical Inst. (Dissertation for the Degree of Candidates in Physicomathematical Sciences).

SO: Vechernaya Moskva January-December 1952

PAVLOV, I. P.

PAVLOV, I. P.: "Immediate and delayed results of the operational treatment of patients with hematogenic osteomyelitis." Second Moscow State Medical Inst imeni I. V. Stalin. Moscow, 1954. (Dissertation for Degree of Candidate in Medical Science).

SO: Knizhnaya Letopis', No. 23, 1954

PAVLOV, I.P.; SHEVAKIN, Yu.F.; YERMANOK, M.Z.

Increasing the productivity of mills for the cold rolling of pipes. TSvet.met. 28 no.6:41-50 N-D '55. (MIRA 10:11)
(Rolling (Metalwork)) (Pipe)

PAVLOV, Ivan Pavlovich; MORDVINTSEV, P.V.

[Guide to practical work in the organization of socialist agricultural enterprises] Rukovodstvo k prakticheskim zaniatiiam po organizatsii sotsialisticheskikh sel'skokhoziaistvennykh predpriiatii. Moskva, Sel'khozgiz, 1959. 462 p. (MIRA 13:11)
(Farm management)

PAVLOV, I.P. ; MELECKOVA, V.G.

Preparation of activated silicate. Bum.prom. 35 no.10:20-21 0 '60. (MIRA 13:10)

1. Vtoraya bumazhnaya fabrika Nemanskogo kombinata.
(Neman—Paper) (Silicate)

PAVLOV, I.P. [Paulau, I.P.], inzh.

How to clean water closets. Rab.i sial. 36 no.5:24 My '60.
(MIRA 13:10)
(Water closets)

PAVLOV, I.P., kand.med.nauk

Immediate and late results of operative treatment of patients suffering from hematogenic osteomyelitis of the long tubular bones. Nauch.trudy Chetv.Mosk.gor.klin.bol'. no.1:196-202 '61. (MIRA 16:2)

1. Iz kafedry obshchey khirurgii pediatricheskogo fakul'teta (zav. - prof. G.P. Zaytsev) 2-go Moskovskogo gosudarstvennogo meditsinskogo instituta imeni N.I. Pirogova, na baze Moskovskoy gorodskoy klinicheskoy bol'nitsy No.4 (glavnyy vrach G.F. Papko).
(OSTEOMYELITIS) (BONES--SURGERY)

PAVLOV, I.P., kand.med.nauk

Thrombosis and embolism of the pulmonary artery, according to data from pathologico-anatomical studies. Sov.med. 26 no.10: 130-133 O '62. (MIRA 15:12)

1. Iz kliniki obshchey khirurgii (zav. - zasluzhennyy deyatel' nauki prof. G.P.Zaytsev) pediatricheskogo fakul'teta II Moskovskogo meditsinskogo instituta imeni N.I.Pirogova i 4-y Gorodskoy klinicheskoy bol'nitsy (glavnyy vrach G.F.Papko; prozektor - prof. Ya.L.Rapoport).
(PULMONARY EMBOLISM)